

## Effects of nonantibiotic feed additives on performance, nutrient retention, gut pH, and intestinal morphology of broilers fed different levels of energy.

### ABSTRACT

An experiment was conducted to determine the effects of different feed additives on performance, nutrient retention, gut pH, and intestinal morphology of broilers fed different levels of energy. This study was a  $4 \times 2$  factorial arrangement of 4 feed additive programs (a basal diet without any feed additive as the control, the basal diet with added organic acid, the basal diet with added prebiotic, and the basal diet with added probiotic) with recommended levels (3,150 and 3,200 kcal of ME/kg of diet for the starter and finisher diets, respectively) or low levels (90% of recommended) of energy. A total of 640 one-day-old male and female broiler chicks were randomly assigned to 8 treatments. Each treatment consisted of 4 replicate floor pens of 20 birds each. Starter and finisher diets were fed from 1 to 21 d and 21 to 42 d of age, respectively. Dietary levels of other nutrients, housing, and general management practices were similar for all treatments. Dietary inclusion of additives had no significant effects on broiler performance, intestinal villus height, crypt depth, gut pH, and dietary AME. Birds fed the low-energy diets were heavier but had inferior FCR compared with those fed the recommended-energy diets. Prebiotic and organic acid significantly ( $P < 0.05$ ) improved protein digestibility. The recommended-energy diets significantly ( $P < 0.05$ ) increased AME and protein digestibility. No interactions were observed for the measured parameters.

**Keyword:** Broiler performance; Energy level; Gut pH; Intestinal morphology; Nonantibiotic feed additive; Nutrient retention.